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PROCESS FOR MAKING SHEET METAL CONTAINERS

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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By:

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Attorney.
To all whom it may concern:

Be it known that I, W. H. Richman, a citizen of the United States, and resident of Philadelphia, Pennsylvania, have invented certain new and useful Improvements in Processes for Making Sheet-Metal Containers, of which the following is a specification.

It is the object of my invention to provide a simple and effective process for making milk cans or like containers from a cylindrical blank whereby a high rate of production and uniform construction will be produced.

The process is carried out by the successive steps indicated in the accompanying drawings, of which:

Figure 1 is a view of the cylindrical blank from which the cans are to be formed;

Figure 2 represents the blank after the first operation;

Figure 3 represents the blank as having been severed to produce two can bodies partly formed;

Figure 4 represents the next step in the operation;

Figure 5 is a diagram of the mandrel and roller for forming the blank up into shape to provide two cans when severed. This diagram also indicating the position of the cutter; and

Figure 6 is a detail sectional view of the cutter and die.

Referring to Figure 1, I take a plain cylindrical blank of sheet metal of a length sufficient for the formation therefrom of two can bodies. This blank is prevented from elongating while being rotated, reduced in diameter and condensed, by being subjected to a spinning swaging operation which provides two circumferential grooves a therein symmetrically axially spaced at substantially the middle of the blank, the metal between the two grooves being rounded in a toric head zone or of a configuration to form the top or head portions of said two can bodies.

After the blank is swaged or formed as shown in Figure 2, it is subjected to a cutting operation which sever it into the two portions shown in Figure 3 which provides the neck a' and the head or mouth portion b'; which latter is one-half of said toric zone.

The two members shown in Figure 3 provide the body blanks for two separate cans and following the operation indicated in Figure 3, the head rim c' is subjected to a curling operation, the result of which is the formation of a toric head or lip as indicated at c'.

The above series of operations completes the neck and head formation into the condition represented in Figure 4. A suitable bottom is applied to the large end of the cylindrical body.

It will be noted from the above that the same swaging or forming operation which reduces the cylindrical blank of Figure 1 at its central portion simultaneously provides the neck portions a and the toric head zone swell b which subsequently when severed as shown in Figure 3 provides the head portions for the separate cans.

In forming the blank I employ a former of sections d', d', d' doveled together at C so that the end sections can be withdrawn from the middle section. The three sections may be also held together by clamping means consisting of a rod f having clamping members g at its ends to bear upon the ends of the blank. The clamping parts may be drawn together by a suitable nut, and the blank will thus be held at its ends while its central portion is being reduced. The rod f and clamping members g of course prevent elongation of said cylindrical blank; so that reduction of the middle portion of the blank to a smaller diameter will, of course, condense and thicken up the metal walls at the points where, ordinarily, they are weakest, i.e., at the points a.

Thickening of the reduced diameter portion of the wall will result throughout this portion.

The central section d' of the former has a hardened tool steel ring d' inserted therein over which the central portion of the blank lies so that a cutter k can operate, to sever the blank at its middle line and then the two can blanks may be removed, with the end sections d', d' of the mandrel after which each blank can be removed from its section of the mandrel.

It will be noticed that the mandrel is divided transversely into the sections d', d', d', at the points where the mandrel is of the smallest diameter, hence there will be no difficulty in removing the end section d' or d' from the blank, and as the blank is divided at its center the two parts readily can be removed from the center section d'.
The cutting of the blank at its center prepares the edges for curling, to provide the bead.

The mandrel with the blank is rotated in a lathe or spinning machine.

By my invention I avoid making a can in several pieces and also the soldering and riveting together of these parts and I produce a can that is absolutely sanitary due to the elimination of soldering and to the non-existence of crevices within the can.

The pressing of a blank upon the mandrel may be accomplished by a swaging or rolling action.

Figures 1 to 3 are in the nature of a diagram representing the hollow cylindrical blank and the hollow cylindrical can bodies formed therefrom.

I claim as my invention:

1. The herein described process for making sheet metal containers, including rotating a cylindrical tubular metal blank of primarily uniform thickness, while preventing elongation thereof and spinning and swaging the intermediate region of said blank body to reduced diameter; thus forming two circumferential neck grooves axially spaced in substantially symmetrical relation with the middle of the length of said blank, and forming between said neck grooves a toric head zone, of smaller diameter than said blank body and larger diameter than said neck grooves; whereby condensing and thickening the metal of said blank at the region thus reduced in diameter; circumferentially severing said blank at its middle, intermediate of the width of said head zone; thus forming two separate container blanks, each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion, and curling the edges of said head portions toward said neck portions and thereby forming a lip upon each of said head portions.

2. The herein described process for making sheet metal containers, including rotating a cylindrical tubular metal blank of primarily uniform thickness, while preventing elongation thereof and spinning and swaging the intermediate region of said blank body to reduced diameter; thus forming two circumferential neck grooves axially spaced in substantially symmetrical relation with the middle of the length of said blank, and forming between said neck grooves a toric head zone, of smaller diameter than said blank body and larger diameter than said neck grooves; whereby condensing and thickening the metal of said blank at the region thus reduced in diameter; circumferentially severing said blank at its middle, intermediate of the width of said head zone; thus forming two separate container blanks, each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion. 4. The herein described process for making sheet metal containers, including rotating a cylindrical tubular blank, while preventing elongation thereof and spinning and swaging the intermediate region of said blank body to reduced diameter; thus forming two separate container blanks, each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion, and curling the edges of said head portions toward said neck portions and thereby forming a lip upon each of said head portions.

3. The herein described process for making sheet metal containers, including rotating a cylindrical tubular blank, while preventing elongation thereof and spinning and swaging the intermediate region of said blank body to reduced diameter; thus forming two neck grooves axially spaced intermediate of the length of said blank and forming between said neck grooves a head zone of smaller diameter than said blank body and larger diameter than said neck grooves; circumferentially severing said blank, intermediate of the width of said head zone; thus forming two separate container blanks, each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion, and curling the edges of said head portions toward said neck portions and thereby forming a lip upon each of said head portions.

4. The herein described process for making sheet metal containers, including rotating a cylindrical tubular blank, while preventing elongation thereof and spinning and swaging the intermediate region of said blank body to reduced diameter; thus forming two neck grooves axially spaced intermediate of the length of said blank and forming between said neck grooves a head zone of smaller diameter than said blank body and larger diameter than said neck grooves; circumferentially severing said blank, intermediate of the width of said head zone; thus forming two separate container blanks, each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion.
both sides of the plane in which it is being severed; thus forming two separate container blanks each comprising a body portion of the original diameter of said blank, a neck portion of smaller diameter than said blank, and a head portion of larger diameter than said neck portion and smaller diameter than said body portion.

6. The herein described process for making sheet metal containers, including rotating a cylindrical tubular blank, while preventing elongation thereof and condensing and thickening the metal of said blank by spinning and swaging the intermediate region of said blank to less diameter intermediate of the length of the blank; circumferentially severing said blank at its middle, while internally supporting said blank upon both sides of the plane in which it is being severed; thus forming two separate container-blanks each comprising a body portion of the original diameter and thickness of said blank, and a neck portion of smaller diameter but greater thickness than said body portion; and curling the thickened severed edges of said blank.

In testimony whereof, I affix my signature.

WALTER H. RICHMAN.